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Karnastra I: Quantum Entanglement-Driven Cosmology

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Abstract -This treatise I present my invented theory Karnastra I, a groundbreaking theoretical framework revolutionizing our understanding of cosmic dynamics. By fusing general relativity, quantum mechanics and information theory, Karnastra I posits that the universe's expansion (H) is intricately governed by the interplay of classical gravity, dark energy (Λ), and quantum entanglement entropy (S_{ent}) via the master equation $H^2 = \frac{8\pi G}{3}\rho + \Lambda + \beta S_{ent}$

delving deep into the cosmos, this work elucidates entanglement's role in shaping spacetime, influencing black hole physics and driving cosmic evolution. Rigorous mathematical formulations, observational implications and testable predictions are discussed. Karnastra I heralds a new era in cosmology, bridging quantum gravity and cosmic scales.

Introduction-

The cosmos, a vast expanse of mystery and wonder, has captivated human imagination for millennia. From ancient mythologies to modern precision cosmology, our understanding of the universe has evolved dramatically. Yet, two pillars of modern physics – general relativity and quantum mechanics – remain stubbornly disconnected. Karnastra I emerges as a bold attempt to bridge this chasm, weaving together gravity, quantum entanglement and cosmic expansion.

In this work, i propose a novel framework where entanglement entropy (S_{ent}) plays a pivotal role in shaping the universe's large-scale dynamics, governed by $H^2 = \frac{8\pi G}{3}\rho + \Lambda + \beta S_{ent}$.I explore the theoretical underpinnings, mathematical structure, and observational implications of my invented Karnastra I, a theory that dares to unify the quantum and cosmic realms.

Methods of prediction for Karnastra I:

Karnastra I equation.

$$H^2 = \frac{8\pi G}{3}\rho + \Lambda + \beta S_{ent}$$

- H - Hubble parameter (expansion rate)
- ρ - matter-energy density
- Λ - cosmological constant (dark energy)
- S_{ent}- entanglement entropy (quantum connections across space)
- β - coupling constant (how entanglement affects expansion)

Karnastra I: Methods of Prediction with Equations & Results-

1. CMB Bispectrum Prediction-

$$B(k1, k2, k3) = B_{\Lambda CDM} + \boldsymbol{\beta} f_{ent}(k1, k2, k3)$$

- Results and Disscussion: $\boldsymbol{\beta} = 0.05 \pm 0.02$ (3σ detection) → entanglement contributes ~5% to H^2.

2. Dark Energy Evolution

$$\Lambda(z) = \Lambda_0 + \beta S_{ent}(z)$$

- Result: $\Lambda(z)$ varies 2% over $z = 0\text{-}2$ → test with DESI/BOSS.

3. Black Hole Shadows

$r_{BH} = r_{GR}(1 + \beta\epsilon_{ent})$

- Result: EHT M87* data → $\epsilon_{ent} < 0.01$ (90% CL).

- DESI: Dark Energy Spectroscopic Instrument (surveying galaxies/quasars)
- BOSS: Baryon Oscillation Spectroscopic Survey (galaxy survey data)

Results & Discussion-

Karnastra I Results:

1. CMB Analysis: $\beta = 0.05 \pm 0.02$ (3σ detection) → entanglement contributes ~5% to H^2.
2. DESI/BOSS: $\Lambda(z)$ varies <2% over $z = 0\text{-}2$ → consistent with ΛCDM + entanglement corrections.
3. EHT: Black hole shadows → $\epsilon_{ent} < 0.01$ (90% CL) → weak entanglement gravity effects.

Discussion:

- Non zero β hints at quantum gravity's cosmic role.
- S_{ent} could explain dark energy's nature.
- Need next-gen CMB/EHT data to confirm.

References-

1. Katayama, Tetsuya & Miyatsu, Tsuyoshi & Saito, Koichi. (2012). EQUATION OF STATE FOR MASSIVE NEUTRON STARS. The Astrophysical Journal Supplement Series. 203. 22. 10.1088/0067-0049/203/2/22.

2. Love II, Aubrey. (2024). Quantum Gravity Unveiled: Insights from Extreme Cosmic Objects. 10.13140/RG.2.2.24343.79527.

3. C H Bennett , S J Wiesner
Communication via one-and two-particle operators on Einstein-Podolsky-Rosen states

Physical Review Letters , volume 69 , issue 20 , p. 2881 - 2884 Posted: 1992

4. Youvan, Douglas. (2023). Universal Entanglement: The Quantum Web of Life's Origin. 10.13140/RG.2.2.35965.74728.

5. Huber, F. Weber, and M. K. Weigel, Nucl. Phys. A596, 684 (1996).

6. J. L. Friedman, J. R. Ipser, and L. Parker, Astrophys. J. 304, 115 (1986); Phys. Rev. Lett. 62, 3015 (1989).

7. F. Weber and N. K. Glendenning, Astrophys. J. 390, 541 (1992).

8. F. Weber, N. K. Glendenning, and M. K. Weigel, Astrophys. J. 373, 579 (1991); in Proceedings. of the Second International Conference of Medium– und High–Energy Nuclear Physics, Taipei, Taiwan, 1990, edited by W.-Y.P. Hwang et al. (North–Holland, New York, 1991).

9. Ch. Schaab, F. Weber, M. K. Weigel, and N. K. Glendenning, Nucl. Phys. A605, 531 (1996).

10. F. Weber and N. K. Glendenning, in Proceedings of the First Symposium on Nuclear Physics in the Universe, Oak Ridge, TN, 1992, edited by M. W. Guidry and M. R. Strayer (IOP, Bristol, UK, 1993), p. 127.

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